
Division 7

SECTION 07130**MEMBRANE WATERPROOFING****PART 1 - GENERAL****1.01 SUBMITTALS**

- A. Product data: Submit manufacturer's product literature and instructions for membrane material and accessories.
- B. Samples: Submit 1'-0" by 1'-0" samples of membrane waterproofing.

PART 2 - PRODUCTS**2.01 MEMBRANE WATERPROOFING**

- A. Membrane: Equivalent to Bituthene System 4000 Membrane as manufactured by Grace Construction Products, Cambridge MA, 1-800-444-6459.

2.02 APPLICATION ACCESSORIES

- A. Surface Conditioner: As approved by manufacturer.
- B. Primer: As approved by manufacturer.

PART 3 - EXECUTION**3.01 INSTALLATION**

- A. Install per manufacturer's instructions.

END OF SECTION

SECTION 07160**BITUMINOUS DAMPPROOFING****PART 1 - GENERAL****1.01 SUBMITTALS**

- A. Product data: Submit manufacturer's product specifications and installation instructions, including rates of application for each type installation specified.

PART 2 - PRODUCTS**2.01 CAVITY WALL DAMPPROOFING**

- A. Acceptable products:
 - 1. Flintkote Co., #710-09 Semi-Mastic Coating.
 - 2. Karnak Chemical Corp., #83 Fibrated Dampproofing (non-asbestos grade).
 - 3. W.R. Meadows, Inc., Seal-Mastic.
 - 4. Sonneborn Div. of Contech, Inc., Hydrocide Semi-Mastic.
 - 5. Other equivalent products as approved by Owner's Project Manager.
- B. Characteristics: Cold applied, bituminous mastic containing reinforcing fibers; brush or spray applied.

PART 3 - EXECUTION**3.01 SURFACE PREPARATION**

- A. Prior to application of materials, remove dirt, grease, mortar droppings and other foreign matter from substrate.
- B. Prime wall surfaces prior to dampproofing application, as required by manufacturer's product data.
- C. Apply dampproofing at temperatures above 40° F., to dry, cured surfaces.

3.02 CAVITY WALL APPLICATION

- A. Spray or brush apply dampproofing in accordance with manufacturer's product data, at a minimum rate of one gal./100 sq.ft.
- B. Apply dampproofing to exterior face of interior masonry wythe in exterior double wythe walls.
- C. Application of dampproofing shall be scheduled to proceed rigid wall insulation installation so that insulation may be secured in dampproofing.

3.03 CLEAN-UP

- A. Protect adjacent finished surfaces from damage or staining from this work by masking prior to application. Repair or replace surfaces damaged or stained by dampproofing work.
- B. At completion of dampproofing operations, remove debris resulting from work, including spilled materials.

END OF SECTION

SECTION 07190**MEMBRANE VAPOR BARRIER****PART 1 - GENERAL****1.01 SUBMITTALS**

- A. Product data: Submit manufacturer's product literature and instructions for membrane material and mastic.
- B. Samples: Submit 1'-0" by 1'-0" samples of membrane vapor barrier.

PART 2 - PRODUCTS**2.01 MEMBRANE VAPOR BARRIER**

- A. Membrane: Ply-Bar Plus II as manufactured by Glas-Kraft, Inc. is the acceptable quality standard. Equivalent products may be used as approved by Owner's Project Manager.
 - 1. Top sheet of black, rot-proof polyethelene film.
 - 2. Asphalt laminate with synthetic chemical polymers for maximum waterproofing and a high melting point.
 - 3. Reinforced with three directional woven fiberglass. The uniform 1/2"x1/2"x1/2" diamond network is imbedded in the laminant.
 - 4. Bottom sheet of heavy durable Kraft paper extrusion coated with black polyethelene.

2.02 ADHESIVE

- A. Acceptable to manufacturer of membrane vapor barrier.

PART 3 - EXECUTION**3.01 INSTALLATION**

- A. Install membrane over compacted, clean subgrade material, free of debris and protrusions.
- B. Lay membrane over interior building area to receive concrete slabs; lap edges 6" and seal with adhesive over entire lap. Apply membrane in greatest practical widths. Lay membrane with seams perpendicular to and lapped in direction of concrete pour. Turn edges of membrane up to within 1/2" of top of slab at intersection with vertical surfaces.
- C. Where expansion or control joints are indicated in slab, lay membrane continuous under joint filler.
- D. Seal openings in membrane around pipes and other protrusions with adhesive. Fold at corners to form envelope.
- E. Protect membrane installation from damage until concrete slab is in place.

END OF SECTION

SECTION 07210**BUILDING INSULATION****PART 1 - GENERAL****1.01 SUBMITTALS**

- A. Product data: Submit manufacturer's product specifications and installation instructions for each type material.

PART 2 - PRODUCTS**2.01 BATT INSULATION**

- A. Walls and Ceiling: Fiberglass batts; thermal resistance rated R-19 for walls, R-30 for ceilings; foil faced, having a perm rating of .5 maximum; width equal to framing spacing. Flame spread rating shall be not more than 25 per ASTM E84; smoke developed rating shall be less than 450 per ASTM E84."

2.02 RIGID EXTRUDED POLYSTYRENE INSULATION (XEPS)

- A. Acceptable products:
1. Amoco Foam Products, Inc.: Amocofoam(R) CM.
 2. Dow Chemical U.S.A.; Styrofoam SM.
 3. UC Industries, Inc.; FormulaR 250 E.
 4. Equivalent products as approved by Owner's Project Manager.
- B. Characteristics:
1. Material: ASTM C578-87a, Type IV, extruded, closed cell, CFC-12 free, polystyrene boards.
 2. Thickness: 1-½" (cavity wall); Thickness: 1-½" (perimeter)
 3. Density: 2.0 PFC< minimum
 4. "K" value at 75° F.: 0.20.
 5. Compressive strength, ASTM D1621-73: 20 minimum.
 6. Water vapor transmission, ASTM E96-80, Procedure B: Maximum 1.1 perm-in.
 7. Size: 1'-4" by 8'-0".
 8. Edges: Square.
 9. Mark each board indicating code compliance and CFC-12 free.
 10. Flame spread rating not more than 25 per ASTM E84.
 11. Smoke developed rating of less than 450 per ASTM E84."
- C. Thermax 600 Series board by Celotex may be used in lieu of polystyrene as follows: 1-½" (cavity wall); 1-½" (perimeter).

2.03 FIRE SAFING

- A. Acceptable product standard: United States Gypsum "Thermafiber Safing".

PART 3 - EXECUTION**3.01 INSTALLATION**

- A. Comply with manufacturer's product data for each type installation.
- B. Install batt insulation in exterior walls and ceilings with vapor barrier to building interior.
- C. Secure rigid insulation to masonry by embedding in tacky dampproofing material. Install between rows of masonry reinforcement with end joints butted.
- D. Install perimeter insulation under slabs and to foundation walls. Butt adjacent boards.
- E. Cut insulation around obstructions and protrusions. Remove projections interfering with installation.

END OF SECTION

SECTION 07253

SPRAYED FIREPROOFING

PART 1 - GENERAL

1.01 WORK INCLUDES

- A. Preparing surfaces to receive fireproofing.
- B. Protect adjacent surfaces from over spraying.
- C. Spray fireproofing of steel structure to provide the hour rated fireproofing as required by applicable code requirements.
 - 1. Columns:
 - a. Supporting more than one floor or other columns
 - b. Supporting one floor only
 - c. Supporting a roof only
 - 2. Beams, joists, girders, trusses and arches:
 - a. Supporting more than one floor or columns
 - b. Supporting one floor only
 - c. Supporting a roof only
 - 3. Roof/Ceiling Construction:
 - a. Deck:
- D. Clean up.

1.02 REFERENCES

- A. UL Fire Hazard Classification.
- B. ASTM E72 - Conducting Strength Tests of Panels for Building Construction.
- C. ASTM E84 - Test for Surface Burning Characteristics of Building Materials.
- D. ASTM E119 - Fire Tests of Building Construction and Materials.
- E. Uniform Building Code, 1997 Edition.

1.03 QUALITY ASSURANCE

- A. Applicator of fireproofing is to be licensed or franchised by manufacturer of fireproofing materials.
- B. Applicator is to provide, in writing, names of previous comparable type and size applications successfully completed on time.

1.04 SUBMITTALS

- A. Submit manufacturer's instructions for fixing and application of sprayed fireproofing for review by Owner's Project Manager.
- B. Provide Engineer and Owner's Project Manager two copies of certified test reports of each of the following:

1. Bond strength of fireproofing: ASTM E72, tested to provide minimum bond strength twenty times weight of fire-proofing, materials.
2. Fire test reports of fireproofing application to substrate materials similar to conditions expected on project.
3. Reports of reputable independent testing agencies, of product proposed for use, which indicates conformance to ASTM E119 and ASTM E84.

1.05 PRE-INSTALLATION CONDITIONS

- A. Ensure structure and surfaces to which sprayed fireproofing is applied is not enclosed and is open to view until application is reviewed.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply spray fireproofing when temperature of substrate material and surrounding air is below 40 degrees F (5 degrees C).

1.08 PROTECTION

- A. Provide ventilation in areas to receive fireproofing during and 24 hours after application.
- B. Protect adjacent surfaces and equipment from damage by overspray fall-out, and dusting.
- C. Provide temporary enclosure to prevent spray from contaminating air.
- D. Close off and seal duct work in areas where fireproofing is being applied.
- E. Protect applied sprayed fireproofing from damage.

1.09 WARRANTY

- A. Provide certificate stating that sprayed fireproofing has been completed in full accordance with requirements to provide necessary fire resistance ratings.
- B. Provide warranty stating applied fireproofing will remain free from cracks, checking, dusting, flaking, spalling, separation and blistering for minimum period of two years from date of Substantial Completion and that failure to provide such performance will constitute reinstallation or repair to satisfaction of Owner at no additional cost.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. W.R. GRACE COMPANY, Cambridge, Massachusetts.
- C. ALBI MANUFACTURING CO., East Berlin, Connecticut.
- D. AMERICAN ENERGY PRODUCTS, Edison, New Jersey.
- E. Substitutions: Under provisions of Section 01300.

2.02 MATERIALS

- A. Cementitious Sprayed Fireproofing: Mill mixed cementitious material blended for even texture; non-fibrous materials; similar to "Monokote" manufactured by W.R. Grace Company conforming to following requirements:
 - 1. Bond Strength: 200 psf, ASTM E 736 when set and dry.
 - 2. Bond Impact: ASTM E72, no cracking, flaking or delamination.
 - 3. Dry Density: Comply with ASTM E 605.
 - 4. Compressive Strength: Less than 10% deformation when subjected to 500 psf in accordance with ASTM.
 - 5. Primer Adhesive: of type recommended by fireproofing manufacturer.
 - 6. Spray Overcoat: To UL requirements and as recommended by manufacturer for specific site conditions.
 - 7. Metal Lath: Expanded metal lath; galvanized.
 - 8. Water: Clean, potable.
 - 9. Air Erosion: Maximum weight loss of fireproofing material .025 gm/sf in accordance with ASTM E 859.

PART 3 - EXECUTION

3.01 GENERAL

- A. Comply with UL classification, FM approval and applicable building code requirements.
- B. Fireproof columns, beams, joists and deck.

3.02 PREPARATION

- A. Fill voids and cracks in substrate, remove projections, and level-in locations where sprayed fireproofing is exposed to view as finish material.
- B. Clean substrate of dirt, dust, grease, oil, loose material, or other matter which affect bond of sprayed fireproofing.
- C. Clean concrete surfaces and remove incompatible form releasing agent.
- D. Remove all incompatible materials which affect bond.
- E. Verify bond requirements and compatibility of surfaces to receive fireproofing materials.
- F. Ensure that clips, hangers, supports, sleeves and other items required to penetrate fireproofing are in place before application.
- G. Ensure that ducts, piping, equipment, or other items which would interfere with application of fireproofing are not positioned until fireproofing work is completed.
- H. Apply metal lath to bar joists and other surfaces as necessary to obtain coverage and compliance with ratings required.

3.03 APPLICATION (Cementitious Fireproofing)

- A. Mix and apply fireproofing in strict accordance with manufacturer's instructions.
- B. Apply primer adhesive and fireproofing in sufficient thickness to achieve rating.

3.04 FIELD QUALITY CONTROL

- A. Perform inspection and testing to ensure that applied thickness and density meets fire rating requirements and to verify installation meets reviewed test reports. Notify Owner's Program Manager prior to placing ceilings; do not proceed with placing ceilings until fireproofing has been approved by Owner's Project Manager.
- B. Correct unacceptable work and pay for further testing required to prove acceptability of installation.
- C. Patch test areas as required to re-establish fire proofing integrity.

3.05 CLEANING

- A. Remove excess and overspray, droppings, and debris.
- B. Remove spray fireproofing from materials and surfaces not specifically required to be fireproofed.

END OF SECTION

SECTION 07270**FIRESTOPPING****PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. Fireproof firestopping and firesafing materials.

1.02 RELATED SPECIFICATIONS

- A. Division 1500 - Mechanical
- B. Division 16000 - Electrical

1.03 REFERENCES

- A. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM E119 - Method for Fire Tests of Building Construction and Materials.
- C. ASTM E814 - Test Method of Fire Tests of Through- Penetration Firestops.

1.04 PERFORMANCE REQUIREMENTS

- A. Fireproofing Materials: ASTM E119 ASTM E814 to achieve required fire rating(s).

1.05 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Provide data on product characteristics, performance and limitation criteria.
- C. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.06 QUALIFICATIONS

- A. Applicator: Company specializing in performing the work of this Section approved by manufacturer.

1.07 REGULATORY REQUIREMENTS

- A. Conform to applicable code for fire resistance ratings and surface burning characteristics.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of combustibility.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when temperature of substrate material and ambient air is below 60 degrees F.

- B. Maintain this minimum temperature before, during, and for 3 days after installation of materials.
- C. Provide ventilation in areas to receive solvent cured materials.

1.09 SEQUENCING

- A. Sequence Work to permit firestopping materials to be installed after adjacent and surrounding work is complete.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers of acceptable products:
 - 1. Tremco - Product: Fyre-shield.
 - 2. 3M Fire Protection Products - Product: Fire Barrier.
 - 3. Dow Corning - Product: Fire Stop Sealant.
 - 4. The Carborundum Company - Product: Fiberfrax.
 - 5. Substitutions: Under provisions of Section 01600.

2.02 MATERIALS

- A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces.

2.03 ACCESSORIES

- A. Dam Material: Type recommended by firestopping manufacturer for specific location and substrate surfaces.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify site conditions.
- B. Verify that openings are ready to receive the Work of this Section.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.
- B. Remove incompatible materials which affect bond.
- C. Install backing materials to arrest liquid material leakage.

3.03 APPLICATION

- A. Apply primer and materials in accordance with manufacturer's instructions.
- B. Apply firestopping material in sufficient thickness to achieve rating and to uniform density and texture.

- C. Install material at walls or partition openings which contain penetrating sleeves, piping, ductwork, conduit and other items requiring firestopping.

3.04 SAFING INSULATION

- A. Install blanket safing insulation sections folded back onto itself to form a U-shaped insert.
- B. Sufficient thickness shall be used to yield a 25% compression on the insert on installation.
- C. Fold shall be facing and flush with the side of the wall requiring the fire rating.

3.05 CLEANING

- A. Clean Work under provisions of Section 01700.
- B. Clean adjacent surfaces of firestopping materials.

3.06 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01500.
- B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 7410**MANUFACTURED ROOFING****PART 1 - GENERAL****1.01 DESCRIPTION**

- A. Provide all materials, labor, equipment and services, and perform all operations in connection with the furnishing and installing of roofing complete, including, but not limited to, the following:
1. A pre-formed and pre-finished metal roofing system, complete with roof insulation.
 2. Perimeter flashing trim, ridge and gable closures and flashing as applicable, fasteners, supplementary furring and supports and sealants required for complete roofing system.
 3. Soffits
 4. Gable Wall Panels
 5. Fascia Wall Panels
 6. Insulation
 7. Roof Curbs
 8. Roof Jacks
 9. Workmanship
 10. Inspection of Surfaces
 11. Protection
 12. Delivery, Samples and Shop Drawings
 13. Guarantee and Warranty

1.02 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: The roof system manufacturer shall meet and provide written certification stating:
1. The manufacturer has been regularly engaged in the fabrication of metal standing seam roof systems for at least ten (10) years. A brief list of similar projects shall be submitted with the shop drawings.
 2. The manufacturer is a member of the Metal Building Manufacturer's Association (MBMA).
 3. The manufacturer is currently certified by the American Institute of Steel Construction (AISC) for category MB.
 4. The manufacturer maintains a CERTIFIED installer program for its products and maintains an up-to-date authorized roofing contractor list.
 5. The manufacturer has a written warranty covering durability, color and weather tightness of its roof system. Sample warranties shall be provided with the bid proposal.
 6. The manufacturer will provide an approved and certified independent third party inspection firm. The inspection firm will provide a certificate of compliance in a start-up, in progress and final inspection mode, certifying that the roof system will be approved to receive a 20-year extended manufacturer's warranty. Recognized approved independent firms will consist of IRWC (Institute of Roofing & Waterproofing Consultants) or RCI (Roof Consultants Institute).
- B. Roofers Qualifications
1. Installation of metal roofing panel and roof-related accessories shall be performed by roofers CERTIFIED / PREFERRED & AUTHORIZED by the manufacturer as trained and qualified to erect the manufacturer's product.
 2. Roofing contractor must submit, as part of the bid package, a letter from the manufacturer of the standing seam metal roofing system, certifying the date of certification from the manufacturer and the dates and year the roofing contractor attended school, prior to full certification.

C. Design Criteria

1. The following standards and criteria shall be used where covered by this specification:
 - a. Manual of Steel Construction, American Institute of Steel Construction - 8th Edition.
 - b. Cold Formed Steel Design Manual, American Iron and Steel Institute - 1986 Edition.
 - c. Low Rise Metal Building Systems Manual, American Iron and Steel Institute - 1986 Edition.
 - d. Test for Wind Uplift Resistance of Roof Assemblies, (1980) Underwriters Laboratories, Inc.
 - e. Applicable building code(s).
2. Design Loads
 - a. Design loads shall be developed using the procedures contained in "Design Practices and Design Practices" commentary in the MBMA publication, Low Rise Metal Building Systems Manual. The following data shall be used in developing design loads in addition to dead loads.
 - b. Vertical Live Loads: Roof system shall be designed for a min. 20 PSF live load or as required for the Bozeman, MT area.
 - c. Wind Loads: Minimum wind speed of 80 miles per hour.
 - d. Other superimposed dynamic and/or static loads such as exhaust fans and air conditioning equipment shall be considered as part of the design requirements and combined with the normal design (live and wind) loads.
 - e. Combination of normal load and auxiliary loads for design purposes shall be as prescribed and recommended in the applicable building code
3. Framing and structural members shall be cold formed and designed in accordance with Cold Formed Steel Design Manual, AISI - 1986.
4. Roof and wall panels shall be designed in accordance with Cold Formed Steel Design Manual, AISI - 1986.

1.03 SUBMITTALS**A. Proposal Drawings**

1. Submit proposal drawings, clearly indicating scope of spacing for attachment to existing structure, roof panels, insulation and ventilation, typical flashing details and typical accessory details.
2. Submit manufacturer's specification on all sealants.
3. Submit applicable sample warranties of products with bid proposals.
4. After awarding of contract, structural analysis of the sub-framing system shall be submitted.
5. Submit for approval descriptive data on all material to be provided. Data shall be sufficient to indicate conformance to specified requirements.
6. Submit manufacturer's recommended installation method showing all requirements for panel installation, sealant application and sub-structural requirements.
7. Submit manufacturer's suggested material handling and material protection requirements.
8. Proposal drawings and structural analysis shall be sealed and signed by a professional engineer, registered in the state of Montana.

1.04 WARRANTY**A. Roof and Wall Panels**

1. Durability of the metallic coated and unpainted roof panels due to rupture, structural failure or perforation shall be warranted for a period of twenty (20) years by the manufacturer.
2. The exterior color finish for painted roof and wall panels shall be warranted by the Manufacturer for twenty (20) years against blistering, peeling, cracking, flaking, chalking and shipping.

3. Excessive color change and chalking shall be warranted for twenty (20) years. Color change shall not exceed 5 NBS units per ASTM D2244.68T, chalking shall not be less than a rating of 6 (white) or 8 (other colors) per ASTM D-659.

- B. Weather Tightness: The entire installation (sub-framing, clips, panels, fasteners) shall be guaranteed weathertight for a minimum of twenty (20) years. Provide written warranty, signed by metal roofing manufacturer and his authorized installer agreeing to replace/repair defective materials and workmanship during the warranty period.

PART 2 - PRODUCTS

2.01 STANDING SEAM ROOF SYSTEM

- A. Approved Products – equivalent in all respects to one of the following:
1. Loc-Seam Panel - American Buildings Company's Loc-Seam Panel roof system.
 2. MBCI - Battenlock
- B. Other manufacturers are acceptable subject to compliance with specified requirements.
1. Deviations in appearance from the quality standard manufacturer's panel must be approved by the Owner before acceptance.
 2. Changes in framing or variations in loading to the existing structure caused by alternate roof systems shall be subject to review and all costs for any modifications shall be the responsibility of the Design-Builder.
- C. System Description - The roof system is a concealed fastener interlocking standing seam system.
1. Roof panels shall be standing seam interlocking design and secured to the supports with a concealed structural fastening system.
 2. The concealed attachment system shall eliminate all through penetration of the exposed roofing surface into structural supports and allow the roof covering to move independently of any differential thermal movement by the framing system.
 3. Panel termination and perimeter flashing (attached to roof panels) shall be sealed with sealants recommended by the manufacturer.
 4. Required closures shall be metal. Non-metal closures shall not be acceptable.
 5. Rigid board insulation shall be mechanically attached to the metal deck in strict compliance with UL 90 requirements, to meet wind uplift codes.
- D. Materials
1. Standing Seam Panel - Standing seam roof panel shall have a configuration consisting of 2 inch high vertical rib spaced on 12 inch or 16 inch centers. The panel shall have flush horizontal and vertical surfaces to facilitate sealing at terminations.
 2. The panel shall be 24 gauge (minimum) commercially pure aluminum coated steel meeting military specification MIL-C-4174A type II or G90 galvanized. Minimum yield stress shall be 50,000 PSI.
 3. Colored Finish - Panels shall have a factory color finish on the exposed side. The exposed finish shall consist of a 70% KYNAR surface. Color to be selected from manufacturer's standards. The dry film thickness of the exterior coating shall not be less than 0.8 mil., exclusive of the primer. The interior color finish shall consist of a blacker coat with a dry film thickness of 0.5 mil.
 4. Wall trim, metal panel lap flashing, edge trims, rake trim and all exposed components shall have a colored finish to match fascia panels. Color shall be selected from manufacturer's standards. Materials shall be 26 gauge minimum galvanized steel, coating designation G-90, conforming to the requirements of ASTM A446 Grade D. Minimum yield stress shall be 50,000 PSI.

2.02 ROOF ACCESSORIES

- A. Roof Jacks - Openings 8" in diameter or smaller may be flashed and sealed to the roof panel by jacks.
1. Material shall be an EPDM material with an aluminum sealing ring base.

2. Installation of roof jacks must comply with manufacturer's instructions.
- B. Roof Curbs
 1. The roof curb units shall be fabricated to the specifications of the roofing manufacturer to assure its compatibility with the roof construction's framing and covering.
 2. The roof curb shall be of size and design to accommodate fans, vents or other roof-mounted equipment. The curb shall support the specific device in a nominally horizontal position above the weather surface of the roof and adequately deflect storm drainage around its periphery.
 3. The contractor is responsible for verification of the various sizes, configurations, and other requirements for curb installation.
 4. All sealants, closures and fasteners, etc. shall be included for proper installation and performance. Roof sub-framing and/or headers between purlins shall be provided for additional rigidity and support of the curb and the equipment.
 5. Roof vent curb and supporting framing shall provide for expected expansion and contraction of roof panels.
- C. Ventilation - The roof shall be ventilated with eave, ridge or sidewall vents as required.
- D. Materials and Construction
 1. Metal roof curb shall be provided with a horizontal flanged top projecting a minimum of 8" above the weather surface plane. Curb design shall incorporate a built-in water deflector to prevent ponding and to direct water around the curb. The base shall fit the roof slope and shall be compatible with the roofing panels to which it is flashed and fastened.
 2. The curb shall be fabricated of 18 gauge Galvalume material. Insulated curbs shall have 1½" thick three pound density fiberglass board insulation at curbs and base.
 3. Miscellaneous Materials
 - a. Sealing compounds shall be as specified and supplied by the roofing manufacturer.
 - b. Closures and fasteners shall conform to the roofing manufacturer's standards compatible with the roof covering furnished.
- E. Installation - Conform to the roofing manufacturer's details and instructions shown on the assembly drawings together with accepted trade practices.

PART 3 - EXECUTION

3.01 ROOF SURFACE CONDITIONS

- A. Inspection
 1. Inspect installed work of other trades and verify that such work is complete to a point where this work may commence.
 2. Verify that installation may be made in accordance with approved shop drawings and manufacturer's instructions.
- B. Discrepancies
 1. In the event of a discrepancy, notify the Owner's Project Manager.
 2. Do not proceed with installation until discrepancies have been resolved.

3.02 INSTALLATION

- A. Install all components within this Section where indicated on the shop drawings, anchoring all components firmly in place in complete accordance with the project drawings, approved shop drawings, and the manufacturer's recommendations.
 1. Provide and install all materials in strict accordance with the manufacturer's instructions, best trade practices, and in a manner to provide a completely watertight installation.
 2. All work will be performed by Preferred/Certified contractors capable of supplying a 20-year labor and materials and weather tight results.

3. Make suitable provisions to allow for free expansion and contraction of all work without causing leaks or rupture. All work shall be securely fastened and, where necessary for strength and/or stiffness, provide suitable reinforcement.
 5. Water shall be prevented from entering the building during the work.
- B. Roof Insulation
1. Install roof insulation in accordance with manufacturer's printed instructions.

END OF SECTION

SECTION 07514**BUILT-UP ASPHALT BITUMINOUS ROOFING****PART 1 - GENERAL****1.01 SYSTEM DESCRIPTION**

- A. Built-up Roofing System: Four-ply asphalt membrane system, insulation, and aggregate surfacing finish.
- B. Receive roofing accessories specified elsewhere in these specifications and install as part of this work.

1.02 RELATED SECTIONS

- A. Related Sections
 - 1. Section 06100 - Rough Carpentry: Wood nailers.
 - 2. Section 07600 - Flashing and Sheet Metal: Counter flashing.
 - 3. Section 07631 - Gutters and Downspouts.
 - 4. Section 07724 - Roof Hatches

1.03 SUBMITTALS

- A. Submittals
 - 1. Submit under provisions of Section 01300.
 - 2. Shop Drawings: Indicate setting plan for tapered insulation, mechanical fastener layout, joint or termination detail conditions and conditions of interface with other materials.
 - 3. Product Data: Provide data indicating membrane and bitumen materials, base flashing materials, insulation and accessory products recommended by manufacturer for complete installation.
 - 4. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
 - 5. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.
 - 6. Manufacturer's Field Reports: Submit in accordance with section 01400.
 - a. Indicate procedures followed; ambient temperatures, humidity, wind velocity during application and supplementary instructions given.

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with manufacturer's printed instructions.

1.05 QUALIFICATIONS

- A. Applicator: Company operating under the same name and specializing in performing the work of this section with minimum five years experience, approved by manufacturer.
- B. Applicator may be required to provide letter of compliance with manufacturer's approved applicator status on manufacturer's letterhead, signed by authorized agent of roofing materials manufacturer.

1.06 REGULATORY REQUIREMENTS

- A. Conform to applicable code for roof assembly fire hazard requirements.
- B. UL: Class A Fire Hazard Classification.
- C. FM: Roof Assembly Classification, wind uplift requirement of I90, in accordance with FM Construction Bulletin 1-28.
- D. Roof assembly shall meet all requirements of UL Design P508.

1.07 PRE-INSTALLATION CONFERENCE

- A. Convene one week prior to commencing work of this section, under provisions of Section 01040.
- B. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Delivery, Storage and Handling
 - 1. Deliver, store, protect and handle products to site under provisions of Section 01600.
 - 2. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
 - 3. Store products in weather protected environment, clear of ground and moisture.
 - 4. Protect insulation from direct exposure to sunlight.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. Apply roofing materials only when temperature is greater than 55 degrees F, when substrate is dry and the weather will permit work to proceed in accordance with manufacturer's printed instructions and these specifications.

1.10 COORDINATION

- A. Coordinate work under provisions of Section 01040.

1.11 WARRANTY

- A. Warranty
 - 1. Provide ten year manufacturer's NDL (No Dollar Limit) system warranty against material and workmanship defects under provisions of Section 01700.
 - 2. Warranty shall include membrane, flashings and insulations.

PART 2 - PRODUCTS**2.01 MANUFACTURERS - SHEET AND BITUMEN MATERIALS**

- A. Manville/Schuller
 - 1. System Specification 4GIG.
 - 2. Roof assembly shall meet all requirements of UL Design P508.
- B. Other acceptable manufacturers offering equivalent products.
 - 1. Tamko
 - 2. Tremco
- C. Substitutions: Under provisions of Section 01600.

2.02 SHEET MATERIALS

- A. Glass Fiber Felts: ASTM D2178, Type IV.

2.03 BITUMINOUS MATERIALS

- A. Asphalt Bitumen: ASTM D312, Type II or/ III.
- B. Asphalt Flood Coat: ASTM D312, Type II or/ III.

2.04 INSULATION

- A. Insulation, where structure sloped for drainage:
 - 1. Ultra Gard Gold (Manville/Schuller).
 - a. Thickness: as required to achieve R-30.

- b. Fasteners: Mechanically attached with Ultrafast (Manville/Schuller) screw and plate. Quantity and pattern recommended by manufacturer to obtain I90.
- 2. Fesco (Manville/Schuller) overlay.
 - a. Thickness: 0.75 inch.
 - b. Installed in asphalt.

2.05 FLASHINGS

- A. Flexible Flashings: Dynaflex (Manville/Schuller).
- B. Control or Expansion Joint Flashing: Metal counter flashings and wood materials, in accordance with NRCA Construction Details.

2.06 ROOF SURFACING

- A. Aggregate: ASTM D1863; sound, hard washed river gravel.
- B. Walkway Pads:
 - 1. Compatible with membrane and acceptable to membrane manufacturer.
 - 2. 1/2" x 12" x 24" J-Walk Pads.

2.07 CANTS

- A. Fiber Cant and Tapered Edge Strips: Asphalt impregnated wood fiberboard, or perlite preformed to 45 degree angle and tapered edge strip.
- B. Wood Blocking: Specified in Section 06100, preservative treated.

2.08 SPLASHBLOCKS

- A. Lightweight concrete splash blocks located at each downspout.

2.09 ROOF CURBS

- A. Roof Curbs
 - 1. The roof curb units shall be fabricated to the specifications of the roofing manufacturer.
 - 2. Roof curbs shall be of size and design to accommodate the various projecting elements to be retained. The contractor is responsible for verification of the various sizes, configurations, and requirements.
 - 3. The roof curb shall be of size and design required for fan, vent or air conditioning equipment. It shall support the specific ventilating device in a nominally horizontal position above the weather surface of the roof and adequately deflect storm drainage around its periphery.

2.10 ACCESSORIES

- A. Accessories as required for complete installation in compliance with roofing manufacturer printed instructions, Construction Drawings and these specifications.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examination
 - 1. Verify that surfaces and site conditions are ready in all respects to receive work in strict accordance with design and manufacturer's recommendations. Verify deck is supported and secure, clean and smooth, flat, free of depressions, waves, or projections, properly sloped to drains or eaves, dry and free of snow and ice and suitable for installation of roof system.
 - 2. Verify roof openings, curbs, and penetrations through roof are solidly set, and wood cant strips and wood nailing strips are in place.

3.02 INSULATION APPLICATION

- A. Insulation Application
 - 1. Install in accordance with manufacturer's instructions and in compliance with applicable standards.
 - 2. Do not apply more insulation than can be covered with membrane in same day.

3.03 MEMBRANE APPLICATION

- A. Install roof membrane in accordance with accepted roofing manufacturer's printed instructions.

3.04 FLASHINGS AND ACCESSORIES

- A. Apply granular surfaced felt base flashings to seal membrane to vertical elements.
- B. Install prefabricated roofing control and expansion joints to isolate roof into areas in accordance with manufacturer's instructions.
- C. Mop in and seal flashings and flanges of items penetrating membrane with two plies of felt.

3.05 AGGREGATE SURFACING

- A. Apply aggregate surface in complete accordance with manufacturer's written instructions for the system provided.
- B. Butt aggregate to edge of traffic pads.

3.06 FIELD QUALITY CONTROL

- A. Correct identified defects or irregularities.
- B. Require site attendance of roofing and insulation material manufacturers daily during installation of the Work.

3.07 CLEANING

- A. Remove bituminous markings from finished surfaces.
- B. In areas where finished surfaces are soiled by bitumen or any other source of soiling caused by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- C. Repair or replace defaced or disfigured finishes caused by work of this section.

3.08 PROTECTION OF FINISHED WORK

- A. Where traffic must continue over finished roof membrane, protect surfaces.

END OF SECTION

SECTION 07514a**AGREEMENT TO MAINTAIN ROOFING**

NOTE TO DESIGN-BUILDER: The Design-Builder shall prepare and provide to the Owner an agreement similar to this example, modified as applicable for this Project.

THIS AGREEMENT is entered into effective _____
20____

between _____ (Roofing
Contractor)

and _____
(Owner)

WHEREAS Roofing Contractor has installed roofing and associated work ("roofing") on Owner's building known as

_____ amounting to approximately _____ square feet of roof area, and has made a prior commitment to enter into this Agreement;

AND WHEREAS this Agreement includes Built-up Asphalt Bituminous Roofing, Custom Sheet Metal Roofing, Flashing and Sheet Metal;

AND WHEREAS Roofing Contractor has issued a "Roofing Warranty" (Guarantee) on the roofing for a defined Period;

NOW THEREFORE Roofing Contractor agrees, for a period of five (5) years after effective date hereof, to provide inspection and maintenance of roofing, subject to terms and conditions hereof; and Owner agrees to terms and conditions hereof; as follows:

1. Semiannual Maintenance Inspections: Without cost to Owner, Roofing Contractor shall inspect entire roof area twice each year: once during months of April or May, and once during months of September or October. Following each inspection, Roofing Contractor shall submit written report to Owner stating nature and circumstances (if known) of observed damages, unusual deterioration, unusual wear, and excessive weathering and shall recommend maintenance work needed to restore roofing and to minimize further deterioration and shall provide a cost estimate or proposal to Owner for recommended work which is not covered by the Roof Warranty. All other work shall be at the Contractor's cost.

2. Temporary Repair Work: At Contractor's cost (but without delaying work for agreement on cost), Roofing Contractor shall respond to each notice by Owner to effect that roofing is not weathertight and shall provide temporary repair work as required to make roofing temporarily watertight. Roofing Contractor shall proceed with work within 24 hours of time each notice is received, except as further delayed by weather conditions that prohibit effective temporary repair work. Owner's notice shall be by telephone (confirmed by letter), telegram, or letter. Temporary repair work shall be omitted when Owner and Roofing Contractor agree that permanent repair work, as hereinafter specified, can proceed without delay and undue risk of damage to Owner's property.

3. Permanent Roofing Work: At Contractor's cost, except as excluded from the Roofing Warranty and when a specific basis of cost has been agreed upon by Owner and Roofing Contractor, and when authorized by Owner, Roofing Contractor shall perform permanent roofing work, hereby

defined to include roofing removal, replacement, repair, maintenance operations, and other similar work as authorized.

4. Basis of Cost: Contractor shall bear cost of work that is Roofing Contractor's obligation under terms of "Roofing Warranty" and that is or was Contractor's obligation under original construction Contract for the building. Except for said exclusion, and except as otherwise agreed upon by Owner and Roofing Contractor from time to time, basis of cost for non-warranty roofing work including temporary repair work shall be actual direct and indirect cost of work, plus a reasonable margin for general overhead expenses and not more than 10 percent for profit, and each of these shall be itemized for Owner's review in Roofing Contractor's estimates and invoices.

5. Review of Agreement to Maintain Roofing: Contractor shall offer renewals of this Agreement to maintain Roofing on the same basis of cost stated herein above.

IN WITNESS THEREOF, this instrument has been duly executed.

Owner's Authorized
Signature: _____

Date: _____ Typed
Name: _____

Title: _____

Roofing Contractor Firm's Execution:

Name of Firm: _____

Street Address: _____

City/State/Zip: _____

Authorized Signature: _____

Date: _____ Typed
Name: _____

Title: _____

ROOFING WARRANTY**WHEREAS** _____

of (Address) _____

herein called the "Roofing Contractor," has performed roofing and associated work ("Work") on following project:

Owner: _____

Address: _____

Name and Type of Building: _____

Address: _____

Area of Work: _____

Date

Acceptance: _____

Warranty

Period: _____

Date

Expiration: _____

AND WHEREAS Roofing Contractor has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

NOW THEREFORE Roofing Contractor hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to maintain said work in watertight condition.

This warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

a) lightning, windstorm caused by winds above 110 mph; b) fire; c) failure of roofing system substrate including cracking, settlement, excessive deflection, excessive deterioration, and excessive decomposition; (excessive deterioration and decomposition of materials due to product failures furnished under Sections 07514, 07600 and 07611 shall not be excluded since they are furnished by the Roofing Contractor) d) faulty construction (by other Contractors except as could be determined by Roofing Contractor's examination) of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work; e) vapor condensation on bottom of roofing; and f) activity on roofing by others including construction contractors, maintenance personnel, other persons, and animals whether authorized or unauthorized by Owner. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Contractor, and until cost and expense thereof has been paid by Owner or by another responsible party so designated.

2. The Roofing Contractor is responsible for damage to work covered by this Warranty, resulting from leaks or faults or defects of work.

3. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Contractor, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and

void upon date of said alterations, but only to extent said alterations affect work covered by this Warranty. If Owner engaged Roofing Contractor to perform said alterations, Warranty shall not become null and void, unless Roofing Contractor, prior to proceeding with said work, shall have notified Owner in writing, showing reasonable cause for claim that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this warranty.

4. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void upon date of said change, but only to extent said change affects work covered by this Warranty.

5. The Owner shall promptly notify Roofing Contractor of observed, known or suspected leaks, defect, or deterioration, and shall afford reasonable opportunity for Roofing Contractor to inspect work, and to examine evidence of such leaks, defects, or deterioration.

6. This Warranty is recognized to be the only warranty of Roofing Contractor on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to him in cases of roofing failure. Specifically, this Warranty shall, not operate to relieve Roofing Contractor of responsibility for performance of original work in accordance with requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this

_____ Day of _____, 20 _____

Owner's Authorized
Signature: _____

Date: _____ Typed
Name: _____

Title: _____

Roofing Contractor Firm's Execution:

Name of Firm: _____

Street Address: _____

City/State/Zip: _____

Authorized Signature: _____

Date: _____ Typed
Name: _____

Title: _____

SECTION 07600**FLASHING AND SHEET METAL****PART 1 - GENERAL****1.01 SUBMITTALS**

- A. Shop drawings: Indicate material types, sizes, shapes, thickness, finishes, fabrication details, anchors, connections, expansion joints and relation to adjacent work. Details and profiles shall be drawn at full size scale.
- B. Product data: Indicate product description, finishes and installation instructions, including interface with adjacent materials and surfaces.
- C. Samples: Submit as follows:
 - 1. Anodized aluminum: 6" by 6" samples of anodized aluminum, indicating full range of color to be expected in finish work.
 - 2. Special finishes: 6" by 6" samples of manufacturer's standard colors for Owner's Project Manager's color selection.
 - 3. Manufactured expansion joint covers, copings, gravel stops, flashing reglets: 1'-0" length in style and finish specified.

1.02 DELIVERY, STORAGE AND HANDLING

- A. Handle materials to prevent damage to surfaces, edges and ends of sheet metal items. Reject damaged material and remove from project site.

1.03 JOB CONDITIONS

- A. Protect roofing and base flashing, prefinished and previously finished surfaces from damage or straining during performance of flashing and sheet metal work. Repair or replace damaged work to original condition.
- B. Prevent accumulation of solder, sealant, bitumen or other materials on finished or exposed surfaces. Remove misplaced materials immediately.

1.04 WARRANTIES

- A. Warrant flashing and sheet metal work to be free of defects in materials and workmanship. Warranty period shall be two years.
- B. Finish warranty: Warrant fluoropolymer coating to be free of checking, crazing, or peeling, chalking and fading, in accordance with coating manufacturer's standard warranty.

PART 2 - PRODUCTS**2.01 SHEET METAL MATERIALS**

- A. Sheets: Meeting ASTM A792, 22 gage, prefinished Galvalume 50 ksi steel.
- B. Mastic: Meeting ASTM D2822-75(1982), fibrated asphalt flashing cement.
- C. Fasteners: Same material or compatible with sheet metal being fastened.
 - 1. Nails: Flathead, needle point, not less than 12 ga. and of sufficient length to penetrate substrate 1" minimum.

2. Expansion shields: Lead or bronze sleeves.
3. Screws: Self-tapping type, with round heads.
4. Bolts: Furnished complete with nuts and washers.
5. Rivets: Round head, solid shank.
6. Blind clips and cleats: Same gauge as sheet metal.

2.02 FINISHES

- A. Fluoropolymer paint finish: Minimum 0.8 mil dry film thickness, fluoropolymer coating based on Pennwalt Corp., Kynar 500, formulated and applied by a licensed applicator of Pennwalt Corp. Colors shall be selected from manufacturer's standard color selections. All exposed sheet metal work shall receive fluoropolymer finish.

2.03 ROOF EXPANSION JOINT COVERS

- A. Acceptable products:
 1. E-Z Flash, Inc., E-Z Flash, Low Profile.
 2. B.F. Goodrich Co., Lexsuo LP.
 3. Johns-Manville Sales Corp., Expand-O-Flash, Series CF.
- B. Characteristics: Prefabricated, flexible neoprene or Tedlar Nitrile flashing with insulated neoprene foam bellows and self-flashing type nailing flanges.
- C. Furnish factory fabricated corner, tee, crossover, transition and termination sections as required.
- D. Splicing accessories:
 1. Adhesive: Manufacturer's recommended splicing adhesive.
 2. Splicing sheet: Sheet material furnished by expansion cover manufacturer.

2.04 FORMED ALUMINUM GRAVEL STOPS

- A. Acceptable products:
 1. W.P. Hickman Co., Inc., Econo-Snap Type II.
 2. MM Systems Corp., SLF Series II.
 3. Metal-Era, System 100.
 4. Architectural Products Co., TE.
- B. Characteristics:
 1. Fascia materials: Formed aluminum alloy.
 2. Fascia height: as indicated on drawings
 3. Fascia finish: Fluoropolymer coating.
 4. Cant materials: Minimum 24 ga. galvanized steel.
 5. Fascia and cant lengths: 10'-0" minimum.
- C. Accessories:
 1. Splice plates: Minimum 0.032" thickness aluminum sheet, minimum 4" width, for concealed installation. Finish shall match fascia.
 2. Prefabricated sections: Factory assembled, mitered corners, downspout starter, overflow scupper, spillout scupper, matching fascia in design and finish.

2.05 FORMED COPINGS

- A. Characteristics:
 1. Material: .22 gage prefinished Galvalume 50 ksi steel
 2. Finish: Fluoropolymer coating.
 3. Lengths: 10'-0" minimum.

4. Joints: Slip type joint or splice plates in accordance with manufacturer's standard practice.
- B. Accessories:
 1. Splice plates: 0.050" thickness aluminum sheet, 4" minimum width, for concealed installation. Finish shall match gravel stop coping.
 2. Hold down clip: 0.050" thickness aluminum of manufacturer's standard design.
 3. Prefabricated sections: Factory assembled mitered corners, overflow scupper and spillout scupper to match gravel stops in design and finish.

2.06 SHEET METAL FABRICATION

- A. Fabricate sheet metal work in accordance with approved shop drawings and industry standards. Form sheet metal work with clear, sharp and uniform arrises. Hem exposed edges.
- B. Make joints in aluminum sheets less than 0.040" thickness using flat-lock seams, 3/4" in width. Fill seams with exterior sealant. Make joints in thicker sheets using seaming or by Tungsten Arc Welding (TIG) or Gas Metal Arc Welding (MIG) processes, using appropriate filler alloy.
- C. Provide linear sheet metal items in minimum 10'-0" sections except as otherwise noted. Form flashing using single pieces for the full width.

PART 3 - EXECUTION

3.01 SHEET METAL INSTALLATION

- A. Install work in accordance with approved shop drawings and industry standards. Sheet metal items shall be true to line, without buckling, creasing, warp, wind or other deformation in finished surfaces.
- B. Coordinate flashing at roof surfaces with roofing work to provide weathertight conditions.
- C. Secure sheet metal items using continuous cleats, clips and blind fasteners as indicated. No exposed face fastening shall be performed.
- D. Fastening:
 1. Nails: Confine to one edge only of flashing 1'-0" or less in width. Space nails at 4" o.c. maximum. Provide neoprene washers for nails.
 2. Cleats: Continuous, formed to profile of item being secured.
 3. Clips: Minimum 2" wide by 3" long formed to profile of item being secured. Space at 2'-0" o.c. maximum except as otherwise indicated.
- E. Form joints in linear sheet metal to allow for 1/2" minimum expansion at 20'-0" o.c. maximum and 8'-0" from corners. Provide 6" wide back-up plate at intersections. Form plates to profile of sheet metal item. Set plate in bead of exterior sealant.
- F. Gravel stops: Install over roof envelope, using continuous cleats along front and back edges, without fasteners in gravel stop.

3.02 EXPANSION JOINT COVER INSTALLATION (BELLOWS TYPE)

- A. Attach expansion joint cover to wood nailer in accordance with manufacturer's product data.
- B. Join lengths using manufacturer's recommended splicing procedures.

- C. Accomplish changes in direction using factory fabricated transition pieces.

3.03 EXPANSION JOINT COVER INSTALLATION

- A. Install expansion joint cover, attaching to wood nailers in accordance with manufacturer's product data.
- B. Secure covers using aluminum or stainless steel screws. Provide expansion between sections as recommended by manufacturer's product data. Install end caps, splice cover and similar transition pieces for weathertight fit.

3.04 PREFABRICATED GRAVEL STOP/COPING INSTALLATIONS

- A. Install prefabricated gravel stops in accordance with manufacturer's product data, true to line, without warp or wind in finished surfaces.
- B. Install cover plates at joints between sections, allowing for expansion and contraction as recommended by manufacturer.
- C. Attach materials using stainless steel fasteners and hold-down clips. Exposed fasteners shall match metal in finish.

3.05 REGLET INSTALLATION

- A. Install reglets as walls are built.
- B. Install reglets as directed by manufacturer's product data, level and true to line. Top of reglet shall be minimum of 7" above high pint of roof insulation.
- C. Provide factory fabricated corners at changes in direction.
- D. Following installation of roofing, install counterflashing by snapping into reglet in accordance with manufacturer's product data.

END OF SECTION

SECTION 07631**GUTTERS AND DOWNSPOUTS****PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. General
 - 1. Precoated gutters and downspouts.
 - 2. ASTM A792 , 22 gage, prefinished Galvalume 50 ksi steel
 - 3. ASTM B486 - Paste Solder.
 - 4. SMACNA - Architectural Sheet Metal Manual.

1.02 SUBMITTALS

- A. Submittals
 - 1. Submit under provisions of Section 01300.
 - 2.. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.
 - 3. Product Data: Provide data on prefabricated components.
 - 4. Samples: Submit two samples, 12 inches long illustrating component design, finish, color, and configuration.

1.03 QUALITY ASSURANCE

- A. Conform to SMACNA Manual for sizing components for rainfall intensity determined by a storm occurrence of 1 in 10 years.
- B. Maintain one copy of document on site.

1.04 REGULATORY REQUIREMENTS

- A. Conform to applicable code for size and method of rain water discharge.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Stack preformed and prefinished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.
- C. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

1.06 COORDINATION

- A. Coordinate work under provisions of Section 01040.
- B. Coordinate the work with downspout discharge pipe inlet.

PART 2 - PRODUCTS**2.01 MATERIALS**

- A. Prefinished Galvalume 50 ksi steel as per ASTM A792 22 gage, finish shall be Kymer Fluorocarbon coating (20 year warranty) color to be selected from manufacturer's standard color selections.

2.02 COMPONENTS

- A. Components
 - 1. Gutters: SMACNA Rectangular style profile.
 - 2. Downspouts: SMACNA Rectangular profile.
 - 3. Accessories: Profiled to suit gutters and downspouts.
 - 4. Lightweight concrete splashblocks located at each downspout.

2.03 ACCESSORIES

- A. Accessories
 - 1. Anchorage Devices: SMACNA requirements.
 - 2. Gutter Supports: Straps.
 - 3. Downspout Supports: Straps.
 - 4. Fasteners: Galvanized steel.
 - 5. Protective Back Coating: FS TT-C-494, bituminous.
 - 6. Flux: FS O-F-506.

2.04 FABRICATION

- A. Fabrication
 - 1. Form gutters and downspouts of profiles and sizes to SMACNA requirements.
 - 2. Fabricate with required connection pieces.
 - 3. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints. Hem exposed edges of metal.
 - 4. Fabricate gutter and downspout accessories; solder watertight.

2.05 FINISHES

- A. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

PART 3 - EXECUTION**3.01 EXAMINATION**

- A. Verify that surfaces are ready to receive work.

3.02 INSTALLATION

- A. Installation: Install gutters, downspouts, and accessories in accordance with manufacturer's instructions. Slope gutters per minimum SMACNA requirements.

END OF SECTION

SECTION 07724**ROOF HATCHES****PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. Prefabricated roof scuttle, with integral support curbs, operable hardware and counter-flashings.

1.02 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Wood curb.
- B. Section 07514 - Built-up Asphalt Bituminous Roofing
- C. Section 07600 - Flashing and Sheet Metal: Flashing to roof system.
- D. Section 09900 - Painting: Field painting.

1.03 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Provide data on unit construction, sizes, configuration, jointing methods and locations when applicable, and attachment method.
- C. Manufacturer's Installation Instructions: Indicate special installation criteria, interface with adjacent components.

1.04 REFERENCES

- A. Underwriters Laboratories (UL) - Fire Hazard Classifications.
- B. Factory Mutual Engineering Corporation (FM): Roof Assembly Classifications.

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable code for UL and FM requirements as applicable to fire rated roof hatches and smoke vents.

PART 2 - PRODUCTS**2.01 MANUFACTURERS**

- A. Manufacturers: Materials are specified by brand names to establish a standard of quality, or by performance requirements and general description of product. The Design-Builder may consider substitutions for brand names specified. The Owner's Project Manager reserves the right to reject any material which, in his/her opinion, will not produce the quality of work specified herein.
- B. Bilco - Product: Roof Scuttle No. S-20.
- C. Substitutions: Under provisions of Section 01600.

2.02 ROOF SCUTTLE

- A. Unit: 30" x 36" size, single leaf type.
- B. Integral Steel Curb: 14 gage galvanized prime painted steel with 1 inch rigid glass fiber insulation; integral cap flashing to receive roof flashing; extended flange for mounting.
- C. Flush Steel Cover: 14 gage galvanized prime painted steel; 1 inch glass fiber foam insulation; sandwiched by 22 gage steel interior liner; continuous neoprene gasket to provide weatherproof seal.

2.03 FABRICATION

- A. Fabricate components free of visual distortion or defects. Weld corners and joints.
- B. Provide for removal of condensation occurring within components or assembly.
- C. Fit components for weather-tight assembly.

PART 3 - EXECUTION**3.01 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Coordinate with installation of roofing system and related flashings for weather-tight installation.

END OF SECTION

SECTION 07900**CAULKING AND SEALANTS****PART 1 - GENERAL****1.01 DEFINITIONS**

- A. Sealant: A weatherproof elastomer used in filling and sealing joints, having properties of adhesion, cohesion, extensibility under tension, compressibility and recovery; shall be designed to make joints air and water tight. Material is designed generally for application to joints at exterior of structures and for other joints subject to movement.
- B. Caulking compounds: A material used in filling joints and seams, having properties of adhesion and cohesion; shall not be required to have extensibility and recovery properties, usually applied to joints at interior of structures.
- C. Caulk: The process of filling joints, without regard to type of material.
- D. Joint failure: A caulked joint exhibiting one or more of the following characteristics:
 - 1. Leaks air and/or water.
 - 2. Sealant migrates.
 - 3. Sealant loses adhesion.
 - 4. Sealant loses cohesion.
 - 5. Sealant does not cure.
 - 6. Sealant discolors.
 - 7. Sealant stains adjacent work.
 - 8. Sealant develops bubbles, air pockets or voids.

1.02 SUBMITTALS

- A. Product data: Submit manufacturer's product description, indicating conformance with specified requirements and installation instructions for each type sealant. Indicate preparation requirements for each substrate condition.
- B. Color samples:
 - 1. Submit samples of manufacturer's standard and special colors as indicated at least 30 days prior to commencement of application.
 - 2. Samples shall be actual materials or literature depicting actual material colors. Owner's Project Manager reserves the right to reject work not in conformance with selected colors, based upon samples submitted.
 - 3. Should Design-Builder select a manufacturer meeting specified requirements, except for minimum color range requirements, he shall be responsible for furnishing special colors within color range requirements. Special colors shall be submitted for Owner's Project Manager's acceptance.

1.03 DELIVERY, STORAGE AND HANDLING

- A. Comply with manufacturer's instructions regarding environmental conditions under which materials may be stored.

1.04 JOB CONDITIONS

- A. Weather conditions:
 - 1. Install no materials under adverse weather conditions, or when temperatures are below or above those recommended by manufacturer.

2. Proceed with work only when forecasted weather conditions are favorable for joint cure and development of high early bond strength.
 3. Wherever joint width is affected by ambient temperature variations, install materials only when temperatures are in lower third of manufacturer's recommended installation temperature.
- B. Protection of adjacent surfaces:
1. Protect by applying masking material or manipulating application equipment to keep materials in joint. If masking materials are used, allow no tape to touch cleaned surfaces to receive sealant. Remove tape immediately after caulking, before surface skin begins to form.
 2. Remove misapplied sealants from surfaces using solvents and methods recommended by manufacturer.
 3. Restore surfaces from which sealants have been removed to original condition and appearance.

PART 2 - PRODUCTS

2.01 POLYURETHANE SEALANT

- A. Acceptable product: Tremco Mfg. Co., Dymeric.
- B. Characteristics:
1. Type: Meeting requirements of Fed. Spec. TT-S00227F, irrespective of primer.
 2. Hardness: 25, Shore A after seven days at 75° F.
 3. Colors: As selected by Architect, including special color to match split face masonry mortar.

2.02 SILICONE SEALANT

- A. Acceptable products:
1. Dow Corning Corp., #790.
 2. General Electric Co., Silicone Products Dept., Sillpruf.
 3. Equivalent products as approved by Owner's Project Manager.
- B. Characteristics:
1. Type: One part silicone rubber.
 2. Colors: As selected by Architect from manufacturer's standard selection.

2.03 ACRYLIC-LATEX CAULKING COMPOUND

- A. Acceptable products:
1. DAP, Inc., DAP Acrylic-Latex Caulk.
 2. Pecora Corp., AC-20.
 3. Sonneborn Div. of Contech, Inc., Sonolac.
 4. Tremco Mfg. Co., Acrylic-Latex Caulk.
- B. Characteristics: Flexible, paintable, non-staining, non-bleeding acrylic emulsion.

2.04 ACCESSORY MATERIALS

- A. Joint cleaner: Type recommended by sealant manufacturer for substrates indicated.
- B. Joint primer/sealer: Type joint primer/sealer recommended by sealant manufacturer.

- C. Bond breaker tape: Plastic tape applied to contact surfaces where bond to substrate or joint filler must be avoided for sealant performance.
- D. Sealant backer rod: Compressible rod stock of polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam or neoprene foam as recommended by sealant manufacturer for compatibility with sealant material. Provide size and shape of rod to control joint depth, break bond at bottom of joint, form optimum shape of bead on back side and minimize possibility of extrusion when joint is compressed.
- E. Tooling agent: Agent recommended by sealant manufacturer to insure contact of material with inner joint faces.

PART 3 - EXECUTION

3.01 JOB MOCK-UP

- A. Prepare, caulk and finish one sample of each joint condition for Owner's approval prior to beginning work. Retain approved samples as a standard for work.

3.02 JOINT SURFACE PREPARATION

- A. Clean joint surfaces immediately before caulking joints. Remove substances which would interfere with bond.
- B. Etch concrete and masonry joint surfaces to remove excess alkalinity, unless sealant manufacturer's product data indicates that alkalinity does not interfere with bond and performance.
- C. Roughen joint surfaces on vitreous coated and similar non-porous materials, unless sealant manufacturer's product data indicates equal bond strength as porous surfaces.

3.03 APPLICATION

- A. Comply with sealant manufacturer's product data except where more stringent requirements are shown or specified. Mix and apply epoxidized polyurethane terpolymer sealant in accordance with manufacturer's product data sheet.
- B. Prime or seal joint surfaces where recommended by sealant manufacturer.
- C. Install backer rod for all caulking materials, except where recommended to be omitted by sealant manufacturer for application indicated.
- D. Employ installation techniques which will insure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete wetting of joint bond surfaces.
- E. Do not allow materials to overflow or spill onto adjacent surfaces.
- F. Remove excess and misplaced materials and clean adjoining surfaces as work progresses.
- G. Cure sealant in accordance with manufacturer's product data to obtain high early bond strength, internal cohesive strength and surface durability.

3.04 CAULKING SCHEDULE

- A. The Design-Builder shall indicate of his project drawings all joints and other locations requiring sealant or caulk, and shall observe the guidelines noted below.
- B. Polyurethane Sealant shall be used in all open joints, at all changes of material, and elsewhere as shown on the exterior of the building.
- C. Polyurethane Sealant, except for those locations specified below, shall be used in interior locations where "Sealant" is shown on the drawings.
- D. Silicone Sealant shall be used in joints around plumbing fixtures, shower pans and kitchen equipment.
- E. Acrylic-Latex Caulking shall be used in interior locations noted to be caulked.

END OF SECTION

SECTION 07921**SECURITY SEALANTS****PART 1 - GENERAL****1.01 GENERAL**

- A. Section Includes : Security sealants, including high strength pick-resistant joint fillers and accessories to seal interior working joints, are used to seal joints at dissimilar materials in cells and seal interior items for visual appearance and security.
- B. Industry standards:
 - 1. SWRI: Association quality standard guidelines for sealant installation, undated.
- C. Product data:
 - 1. Manufacturer's product description, including conformance with specified requirements and installation instructions for each type security sealant or joint filler; include specific requirements for primer and backer rod type.
- D. Shop Drawings: Complete shop drawings and schedules; indicate joint locations and security sealant or joint filler selection and color for each joint.
- E. Mock-ups:
 - 1. Prepare, caulk, and finish one sample of each joint condition.
 - 2. Obtain Owner's Project Manager's approval of sample joints prior to beginning work; retain approved samples as standard for work.
- F. Special warranty: Watertight and free of defects in materials and workmanship, including joint failure.

PART 2 - PRODUCTS**2.01 PRODUCTS**

- A. High strength pick resistant joint filler, HV2HS-1:
 - 1. Acceptable manufacturers:
 - a. Dural International Corp.
 - b. Sika Corp.
 - c. Schul International Corp.
 - 2. Characteristics:
 - a. Standard of quality: Shul International Company; PrisonLoc 30.
 - b. Multi-component non sag adhesive, ASTM C881-86, Type III, Grade 3, Class B and C; minimum elongation at break 30%, ASTM D-638-89 test method.
 - c. Hardness: Shore D: 60
 - d. Joint design: Five times movement.
 - e. Self-extinguishing material.
 - 3. System:
 - a. Manufacturer's recommended bonding agent to surfaces receiving HV2HS-1.
 - b. Place compressible filler between HV2HS-1 and precast concrete panel.
 - c. Mix high strength pick resistant joint filler; install as main filler in horizontal and vertical joints; size 5X for movement.
- B. Joint cleaner: Type recommended by security sealant manufacturer for substrates indicated.

- C. Joint primer/sealer: Type recommended by security sealant manufacturer for conditions encountered.
- D. Bond breaker type: Plastic type tape recommended by security sealant manufacturer for application to contact surfaces to prevent bond substrate or joint filler for security sealant material performance.
- E. Sealant backer rod:
 - 1. Type, generic: Compressible rod stock closed cell foam, open cell foam, soft cell foam, or neoprene foam; type recommended by security sealant manufacturer for material compatibility and conditions encountered.
 - 2. Rod size and shape to control joint depth, break bond at joint bottom, form optimum shape of bead on back side, and minimize possibility of extrusion when joint is compressed.
- F. Tooling agent: Agent recommended by security sealant manufacturer to ensure contact of material with inner joint faces.
- G. Divider strips: Synthetic rubber or closed cell synthetic foam not less than 1/16" thick and full depth of security sealant material; approved by manufacturers of dissimilar materials as being compatible with each other.

PART 3 - EXECUTION

3.01 EXECUTION

- A. Protection:
 - 1. Protect adjacent surfaces by appropriate means.
 - 2. Remove misapplied security sealant materials from surfaces using solvents and methods recommended by manufacturer(s).
 - 3. Restore surfaces to original condition and appearance where security sealant materials have been removed.
- B. Comply with security sealant material's manufacturer's printed installation instructions, requirements of ASTM C962-86 and SWRI.
- C. Surface preparation, general:
 - 1. Clean joint surfaces immediately before caulking joints.
 - 2. Etch concrete and masonry joint surfaces to remove alkalinity, unless security sealant material manufacturer's product data indicates alkalinity does not interfere with bond and performance. Use security sealant manufacturer's recommended materials in accord with reviewed installation instructions and product data,
 - 3. Roughen joint surfaces on vitreous coated and similar non-porous materials, unless security sealant material manufacturer's data indicates equal bond strength as porous surfaces.
- D. Primer: Prime or seal joint surfaces when recommended and in accordance with security sealant manufacturer's recommendations.
- E. Backer rod: Install for security sealant materials, except where specifically recommended to be omitted by security manufacturer for application indicated.
- F. Security sealant materials:
 - 1. Employ installation techniques ensuring materials are deposited in uniform, continuous ribbons without gaps or air pockets.

2. Cure in accord with manufacturer's product data to obtain high early bond strength, internal cohesive strength, and surface durability.
- G. General:
1. Schedule below indicates general security sealant locations and usage type. Note: Not all types of inmate housing or security levels noted below may occur in this project.
 2. Reviewed submittals indicate exact location of each sealant.
- H. Security sealant schedule:
1. High strength pick resistant joint filler, HV2HS-1:
 - a. Medium security dormitories:
 - 1) CMU wall to conc. ceiling.
 - 2) CMU wall to HM frame.
 - 3) Perimeter detention equipment and grilles to adjacent material.
 - 4) Perimeter plumbing to adjacent materials.
 - 5) VCT/conc. floor to CMU wall.
 - b. Medium and maximum security cells:
 - 1) CMU/conc. wall to conc. ceiling..
 - 2) CMU/conc. Wall to HM frame.
 - 3) Perimeter detention equipment, accessories, and grilles to adjacent materials.
 - 4) Perimeter plumbing fixtures to adjacent materials.
 - c. Light fixture to concrete ceiling in cells.
 - d. CMU/conc. Wall to conc. ceiling in maximum security cells.
 - e. Sealant joints exposed to view at security plaster soffit or ceiling to CMU/conc.
 - f. All sealant joints exposed to view and not within line of sight of Officer's Station including CMU/conc. Wall to HM frame.
 - g. CMU wall to HM frame or shelf at Visitation Booths serving non-maximum security inmates.
 - h. Sealant joints exposed to view including CMU/conc. wall to HM frame, plumbing fixture perimeter to adjacent material, and detention equipment and grilles to adjacent materials.
 - i. CMU/conc. Wall to HM frame or shelf at Visitation booths serving maximum security inmates.

END OF SECTION